

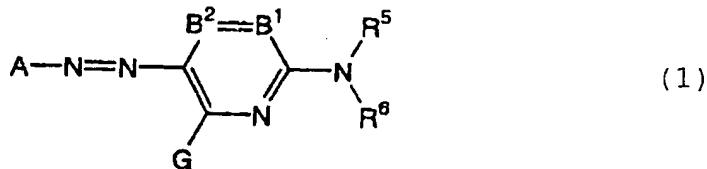
AMENDMENT UNDER 37 C.F.R. § 1.111
Application No.: 10/611,990
Atty Docket No.: Q76445

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

Claim 1. (original): An ink for ink jet recording comprising:
at least one dye represented by the following general formula (1), in which the at least one dye is dissolved or dispersed in an aqueous medium; and
a betaine surfactant,
wherein, when the ink has been shaken 30 times or more for 10 seconds and allowed to stand for 3 minutes, a bubble height in the ink is 30 mm or less:



wherein A represents a five-membered heterocyclic group; B¹ and B² each represents =N-, =CR¹- or -CR²=, and when one thereof represents =N-, the other represents =CR¹- or -CR²=; R⁵ and R⁶ each independently represents a hydrogen atom or a substituent group, wherein the substituent group represents an aliphatic group, an aromatic group, a heterocyclic group, an acyl group, an alkoxy carbonyl group, an aryloxy carbonyl group, a carbamoyl group, an alkylsulfonyl group, an arylsulfonyl group or a sulfamoyl group, and a hydrogen atom of each substituent group may be substituted; G, R¹ and R² each independently represents a hydrogen atom or a substituent group, wherein the substituent group represents a halogen atom, an aliphatic group,

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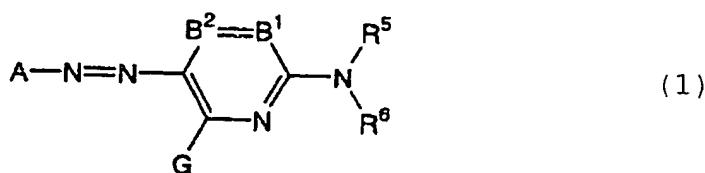
an aromatic group, a heterocyclic group, a cyano group, a carboxyl group, a carbamoyl group, an alkoxy carbonyl group, an aryloxycarbonyl group, a heterocyclic oxycarbonyl group, an acyl group, a hydroxyl group, an alkoxy group, an aryloxy group, a heterocyclic oxy group, a silyloxy group, an acyloxy group, a carbamoyloxy group, an alkoxy carbonyloxy group, an aryl oxycarbonyloxy group, an amino group, an acylamino group, a ureido group, a sulfamoylamino group, an alkoxy carbonylamino group, an aryloxycarbonylamino group, an alkylsulfonylamino group, an arylsulfonylamino group, a heterocyclic sulfonylamino group, a nitro group, an alkylthio group, an arylthio group, a heterocyclic thio group, an alkylsulfonyl group, an arylsulfonyl group, a heterocyclic sulfinyl group, an alkylsulfinyl group, an arylsulfinyl group, a heterocyclic sulfamoyl group or a sulfo group, and a hydrogen atom of each substituent group may be substituted; and R¹ and R⁵, or R⁵ and R⁶ may combine with each other to form a five- or six-membered ring.

Claim 2. (original): An ink for ink jet recording comprising:

at least one dye represented by the following general formula (1), in which the at least dye is dissolved or dispersed in an aqueous medium; and

a betaine surfactant,

wherein a bubble height in the ink just after the ink has been shaken 30 times or more for 10 seconds, is 50 mm or less:



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wherein A represents a five-membered heterocyclic group; B¹ and B² each represents =N-, =CR¹- or -CR²=, and when one thereof represents =N-, the other represents =CR¹- or -CR²=; R⁵ and R⁶ each independently represents a hydrogen atom or a substituent group, wherein the substituent group represents an aliphatic group, an aromatic group, a heterocyclic group, an acyl group, an alkoxy carbonyl group, an aryloxycarbonyl group, a carbamoyl group, an alkylsulfonyl group, an arylsulfonyl group or a sulfamoyl group, and a hydrogen atom of each substituent group may be substituted; G, R¹ and R² each independently represents a hydrogen atom or a substituent group, wherein the substituent group represents a halogen atom, an aliphatic group, an aromatic group, a heterocyclic group, a cyano group, a carboxyl group, a carbamoyl group, an alkoxy carbonyl group, an aryloxycarbonyl group, a heterocyclic oxycarbonyl group, an acyl group, a hydroxyl group, an alkoxy group, an aryloxy group, a heterocyclic oxy group, a silyloxy group, an acyloxy group, a carbamoyloxy group, an alkoxycarbonyloxy group, an aryl-oxycarbonyloxy group, an amino group, an acylamino group, a ureido group, a sulfamoylamino group, an alkoxy carbonyl amino group, an aryloxycarbonyl amino group, an alkylsulfonyl amino group, an arylsulfonyl amino group, a heterocyclic sulfonyl amino group, a nitro group, an alkylthio group, an arylthio group, a heterocyclic thio group, an alkylsulfonyl group, an arylsulfonyl group, a heterocyclic sulfonyl group, an alkylsulfinyl group, an arylsulfinyl group, a heterocyclic sulfinyl group, a sulfamoyl group or a sulfo group, and a hydrogen atom of each substituent group may be substituted; and R¹ and R⁵, or R⁵ and R⁶ may combine with each other to form a five- or six-membered ring.

Claim 3. (original): The ink for ink jet recording according to claim 1 or 2, wherein A in the formula (1) represents a pyrazole ring, an imidazole ring, a thiazole ring, an isothiazole

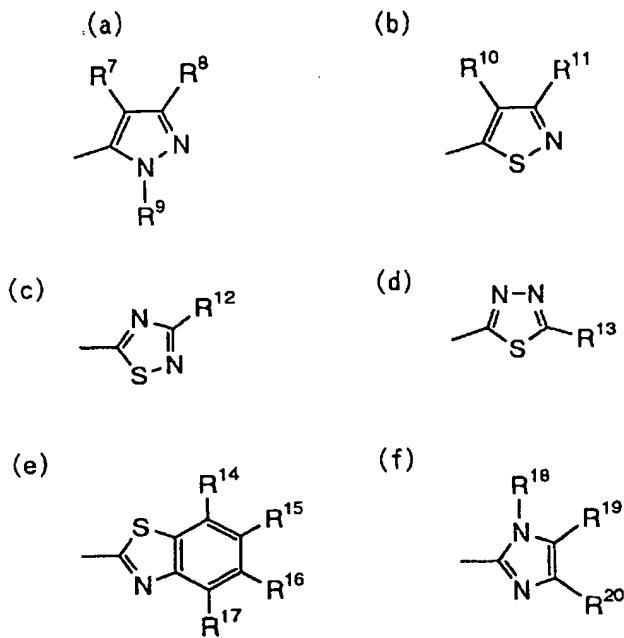
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ring, a thiadiazole ring, a benzothiazole ring, a benzoxazole ring or a benzoisothiazole ring, each of which may have a substituent group.

Claim 4. (original): The ink for ink jet recording according to claim 1 or 2, wherein A in the formula (1) is a pyrazole ring, an imidazole ring, an isothiazole ring, a thiadiazole ring or a benzothiazole ring, represented by the following general formulae (a) to (f):



wherein R⁷ to R²⁰ each has the same definition as with G, R¹ and R² in the general formula (1).

Claim 5. (original): The ink for ink jet recording according to claim 1 or 2, wherein, when the dye represented by the formula (1) is a water-soluble dye, the dye represented by the formula (1) further has an ionic hydrophilic group as a substituent group at any position of R¹, R², R⁵, R⁶ and G, and the ionic hydrophilic group is at least one of a sulfo group, a carboxyl group, a phosphono group and a quaternary ammonium group.

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Claim 6. (original): The ink for ink jet recording according to claim 1 or 2, wherein the betaine surfactant is a compound having both a cationic site and an anionic site in its molecule and having surface activity, in which the cationic sites include at least one of a nitrogen atom of an amine, a nitrogen atom of a heteroaromatic ring, a phosphorus atom and a boron atom having four bonds with carbon.

Claim 7. (original): The ink for ink jet recording according to claim 1 or 2, which comprises the betaine surfactant in an amount of 0.001 to 50 wt%.

Claim 8. (original): The ink for ink jet recording according to claim 1, wherein a bubble height in the ink just after the ink has been shaken 30 times or more for 10 seconds, is 50 mm or less.

Claim 9. (original): The ink for ink jet recording according to claim 1 or 2, which further comprises an antifoaming agent that is a compound itself existing on a liquid surface in place of a causative substance of foaming, and having no ability to give repulsive force resistant to thinning of a bubble film for itself, in which the antifoaming agent is at least one of alcohols, ethers, fatty acid esters, metal soaps, phosphates, silicones and nonionic surfactants.

Claim 10. (original): The ink for ink jet recording according to claim 9, which further comprises the antifoaming agent in amount of 0.001 to 5 wt%.

Claim 11. (original): The ink for ink jet recording according to claim 1 or 2, wherein the ink is prepared by applying a sonic vibration with energy equivalent to or higher than that of receiving at a recording head, during the process of producing the ink, in order to prevent bubbles from being generated by pressure applied to the ink at the recording head.

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Claim 12. (original): The ink for ink jet recording according to claim 1 or 2, wherein the ink is filtrated after an ink solution preparation by a filter having an effective diameter of 1 μm or less.

Claim 13. (original): An ink jet recording process comprising using the ink for ink jet recording according to claim 1 or 2.

Claim 14. (original): An ink jet recording process comprising:
ejecting ink droplets depending on a recording signal onto an image-receiving material comprising a support having provided thereon an image-receiving layer that includes white inorganic pigment particles; and

recording an image on the image-receiving material,

wherein the ink droplets comprise the ink for ink jet recording according to claim 1 or 2.

Claim 15. (original): The ink jet recording process according to claim 14, wherein the support is a chemical pulp, a mechanical pulp or a used paper pulp.

Claim 16. (original): The ink jet recording process according to claim 14, wherein the white inorganic pigment particles is at least one of calcium carbonate, kaolin, talc, clay, diatomaceous earth, synthetic amorphous silica, aluminum silicate, magnesium silicate, calcium silicate, aluminum hydroxide, alumina, lithopone, zeolite, barium sulfate, calcium sulfate, titanium dioxide, zinc sulfide or zinc carbonate.

Claim 17. (original): The ink jet recording process according to claim 14, wherein an image-receiving material further comprises a back coat layer including a white pigment and an aqueous binder.

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Claim 18. (new): The ink for ink jet recording according to claim 1, wherein the ink further comprises at least one compound of alcohols, di-t-amylphenoxyethanol, 3-heptyl cellosolve, nonyl cellosolve, fatty acid esters, metal soaps, phosphates, silicones and nonionic surfactants selected from:

(1) alkyl allyl ether ethylene oxide addition product;

(2) $\text{HO}-(\text{C}_2\text{H}_4\text{O})_n-(\text{C}_3\text{H}_6\text{O})_m-(\text{C}_2\text{H}_4\text{O})_n-\text{OH}$ having a molecular weight of 500 to 10,000 and a $\text{C}_2\text{H}_4\text{O}$ content of 0% to 55%;

(3) $\text{R}_1(\text{R}_2)\text{CHCOO}(\text{C}_2\text{H}_4\text{O})_n$ wherein R_1 and R_2 each represents an alkyl group having 1 to 10 carbon atoms, and n is from 1 to 8; and

(4) acetylenediol and its addition product to which 0 to 8 moles of ethylene oxide is added.

Claim 19. (new): The ink for ink jet recording according to claim 18, wherein the at least one compound is present in an amount of 0.001% to 5% by weight

Claim 20. (new): The ink for ink jet recording according to claim 18, wherein the at least one compound is at least one of the silicones and the non-ionic surfactants.

Claim 21. (new): The ink for ink jet recording according to claim 18, wherein the at least one compound is at least one of the nonionic surfactants.